WHAT IS CLAIMED IS:

1. A solid-state image pickup apparatus including a plurality of photosensitive cells for performing a photoelectric conversion for incident light arranged two-dimensionally in a photosensitive array for receiving the incident light, the photosensitive cells being arranged obliquely adjacent to each other at positions shifted from each other by a length in row and column which is substantially equal to the half of a pitch at which the photosensitive cells are disposed in the row and column direction, wherein an image signal output from an image pickup section for transferring signal charge obtained by the photoelectric conversion by each of the photosensitive cells in response to a drive signal at a predetermined timing is converted to a digital signal, and a picture signal is generated by performing a signal processing on the digital signal,

said image pickup section comprising:

a color separator having color filters for separating the incident light into at least three separated colors, color filters of at least one of the separated colors being arranged in the column direction; and

a signal reading out section for transferring the signal charge only to transfer devices each arranged in the column direction associated with one of said photosensitive cells,

said apparatus comprising:

a mode setting section for setting either a whole-pixel reading out mode of reading out signal charge from all of said photosensitive cells or a specifying reading out mode of reading out only signal charge of the at least one separated color;

a drive signal generator for generating the drive signal in response to an instruction of said mode setting section, and selectively supplying the drive signal generated in accordance with the mode set; and

a control section for controlling a generation of the drive signal by said drive signal generator in accordance with

the mode set by said mode setting section, and controlling a signal processing for the picture signal.

2. An apparatus in accordance with claim 1, wherein the separated colors are primary colors, red R, green G and blue B, the at least one separated color being G.

3. An apparatus in accordance with claim 2, wherein said color separator includes a completely checkered pattern in which the color filters of the color G are arranged in a stripe in the column direction and in a square lattice, and the color filters of the same color selected from either the color R or the color B are arranged at positions diagonal to each other interposing the color filter of the color G therebetween, or in a checkered pattern in which the color filters of the color G are arranged in the square lattice shape, the color filters of the different colors, either the color R or the color B, are arranged at positions diagonal to each other so as to interpose the color filter of the color G therebetween, and the color filters of the same color, either the color R or the color B, are arranged on the same row.

4. An apparatus in accordance with claim 2, wherein in the specifying reading out mode, said drive signal generator supplies selectively the drive signal only to said signal reading out section adjacent to the photosensitive cells corresponding to the color filters of the color G.

5. An apparatus in accordance with claim 4, wherein in the specifying reading out mode, said drive signal generator supplies an independent specifying drive signal only to one of said signal reading out sections provided in a predetermined region approximately symmetrical with a center in the column direction and extending at least 1/4 or more of an entire

effective imaging field.

6. An apparatus in accordance with claim 2, wherein said plurality of transfer devices from groups arranged in the column direction and each including eight transfer devices, and said signal reading out section is arranged for performing a field shift only for two electrodes adjacent to the photosensitive cells of the color filters of the color G among electrodes supplied with said drive signal at a predetermined timing associated with the transfer devices, and

wherein the specifying drive signal is supplied to a specifying electrode associated with said two electrodes disposed at said predetermined region on a wiring independent from that for a drive signal supplied in the whole-pixel reading out mode.

7. An apparatus in accordance with claim 6, wherein said signal reading out section is arranged for the first and fifth transfer devices with respect to the line including the photosensitive cells of the color G, and for the third and seventh transfer devices with respect to the line including the photosensitive cells of both of the colors R and B, among said eight transfer devices of each of the groups.

8. An apparatus in accordance with claim 3, wherein said drive signal generator supplies selectively the drive signal only to said signal reading out section adjacent to said photosensitive cells which are associated with the color filter of the color G in the specifying reading out mode.

9. An apparatus in accordance with claim 8, wherein in the specifying reading out mode, said drive signal generator supplies an independent specifying drive signal only to one of said signal reading out sections provided in a predetermined

region approximately symmetrical with a center in the column direction and extending at least 1/4 or more of an entire effective imaging field.

10. An apparatus in accordance with claim 9, wherein said plurality of transfer devices from groups arranged in the column direction and each including eight transfer devices, and said signal reading out section is arranged for performing a field shift only for two electrodes adjacent to the photosensitive cells of the color filters of the color G among electrodes supplied with said drive signal at a predetermined timing associated with the transfer devices, and

wherein the specifying drive signal is supplied to a specifying electrode associated with said two electrodes disposed at said predetermined region on a wiring independent from that for a drive signal supplied in the whole-pixel reading out mode.

11. An apparatus in accordance with claim 10, wherein signal reading out section is arranged for the first and fifth transfer devices with respect to the line including the photosensitive cells of the color G, and for the third and seventh transfer devices with respect to the line including the photosensitive cells of both of the colors R and B, among said eight transfer devices of each of the groups.

12. A method of reading out an image signal from a plurality of photosensitive cells for performing a photoelectric conversion for incident light arranged two-dimensionally in a photosensitive array for receiving the incident light, the photosensitive cells being arranged obliquely adjacent to each other at positions shifted from each other by a length in row and column directions which is substantially equal to the half of a pitch at which the photosensitive cells are disposed

in the row and column directions, wherein an image signal output from an image pickup section for transferring signal charge obtained by the photoelectric conversion by each of the photosensitive cells in response to a drive signal at a predetermined timing is converted to a digital signal, and a picture signal is generated by performing a signal processing on the digital signal,

said method comprising the steps of:

setting one of a whole-pixel reading out mode of reading out the signal charge from all of the photosensitive cells of at least three separated colors and a specifying reading out mode of reading out the signal charge from only the photosensitive cells of at least one of the separated colors;

generating the drive signal in response to the mode set, and selectively supplying the drive signal generated; and

separating the incident light to the at least three separated colors;

allowing the incident light separated to be incident onto the photosensitive cells;

reading out the signal charge obtained from all of the photosensitive cells in response to the drive signal supplied in the whole-pixel reading out mode, and performing a field shift for the signal charge only from the photosensitive cells corresponding to the at least one separated color among the photosensitive cells in response to the drive signal supplied in the specifying reading out mode;

transferring the signal charge in a column direction, which is transferred in the shift step of reading out, in response to the drive signal supplied; and

transferring the signal charge, after transferred a line shift to an end of the transfer path in the step of transferring, in a horizontal direction in response to the drive signal supplied.

13. A method in accordance with claim 12, wherein the separated colors are primary colors, red R, green G and blue B, the at least one separated color being G.

14. A method in accordance with claim 13, wherein said step of generating the drive signal comprises the substeps of:

generating a field shift signal which is for reading out the signal charge from the photosensitive cells of the color G of the color filter in said specifying reading out mode;

generating a timing signal of a column transfer which sets a transfer distance to a value equivalent to two lines when the field shift signal is supplied and the signal charge is transferred in the column direction; and

generating a timing signal of a row transfer to transfer the signal charge transferred in a row direction and to output the signal charge after performing a line shift by transferring the signal charge in the column direction;

said substeps being iterated to thereby read out the signal charge from the photosensitive cells of the color G.

15. A method in accordance with claim 14, wherein in said substeps of generating a timing signal of a row transfer, the timing signal of the row transfer is generated for transferring the signal charge in the row direction by a transfer distance equivalent to two lines, and being iterated, and in the said row signal supply step of the second time, all of the signal charges of the photosensitive cells of the color G are read out.

16. A method in accordance with claim 13, wherein in said step of generating the drive signal a predetermined region of at least 1/4 or more of an effective imaging field is specified to a specified reading out region of the signal charge

which is approximately symmetrical with a center in the column direction when said signal charge is read out from the photosensitive cells of the color G of the color filter in the specifying reading out mode, and the drive signal is supplied to the specified reading out region as the drive signal for an independent specified electrode.

17. A method in accordance with claim 13, wherein said step of reading out the signal charge comprises the substeps of preparing a plurality of transfer devices arranged in the column direction into groups each including eight transfer devices, and performing a field shift only by two electrodes associated with the photosensitive cells of the color filters of the color G among electrodes supplied with the drive signal at a predetermined timing corresponding to the transfer devices, and

wherein in the whole-pixel reading out mode, among the photosensitive cells associated with each of groups, the first and fifth transfer devices in the line including the color filters of the color G are supplied and operated with one drive signal, and the third and seventh transfer devices in the line including the color filters of the colors R and B are supplied and operated with another drive signal.

18. A method in accordance with claim 17, wherein in said step of reading out the signal charge, said other drive signal supplied to the first and fifth transfer devices in the specified reading out region in the specifying reading out mode is used as a drive signal for an independent specified electrode, which is distinguished from the one drive signal in the whole-pixel reading out mode.

19. A method in accordance with claim 15, wherein in said step of generating the drive signal a predetermined region

of at least 1/4 or more of an effective imaging field is specified to a specified reading out region of the signal charge which is approximately symmetrical with a center in the column direction when said signal charge is read out from the photosensitive cells of the color G of the color filter in the specifying reading out mode, and the drive signal is supplied to the specified reading out region as the drive signal for an independent specified electrode.

20. A method in accordance with claim 19, wherein said step of reading out the signal charge comprises the substeps of preparing a plurality of transfer devices arranged in the column direction into groups each including eight transfer devices, and performing a field shift only by two electrodes associated with the photosensitive cells of the color filters of the color G among electrodes supplied with the drive signal at a predetermined timing corresponding to the transfer devices, and

wherein in the whole-pixel reading out mode, among the photosensitive cells associated with each of groups, the first and fifth transfer devices in the line including the color filters of the color G are supplied and operated with one drive signal, and the third and seventh transfer devices in the line including the color filters of the colors R and B are supplied and operated with another drive signal.

21. A method in accordance with claim 20, wherein in said step of reading out the signal charge, said other drive signal supplied to the first and fifth transfer devices in the specified reading out region in the specifying reading out mode is used as a drive signal for an independent specified electrode, which is distinguished from the one drive signal in the whole-pixel reading out mode.